Amendments to the Claims:

Please amend claims 10 and 26 and add claims 33-70 as shown in the following listing of claims. This listing of claims will replace all prior versions and listings of claims in the application:

1-9. (cancelled)

10. (currently amended) An apparatus for receiving data from a ~~fiber~~ channel, the apparatus comprising:

an input that receives a wideband signal;

a plurality of mixers that accept the wideband signal and mix it with a mixer frequency;

a plurality of low-pass filters that filter the outputs of the mixers;

a plurality of programmable demodulators, each accepting the output of one of the filters and demodulating said filter output, thereby providing a demodulated digital output;

a combiner circuit for combining the demodulated digital outputs from the plurality of programmable demodulators into at least one digital data stream; ~~and~~

at least one demodulator providing soft decisions as an output; and

at least one trellis decoder that accepts soft decisions from the at least one demodulator and provides a trellis decoding of the soft outputs and provides a hard decision to the combiner input.

11. (original) An apparatus as in claim 10 wherein the mixer frequency is a programmable frequency.

12. (previously presented) An apparatus as in claim 10 wherein the plurality of low-pass filters have programmable bandwidth.

13. (original) An apparatus as in claim 10 wherein the programmable demodulators further comprise a control input that controls the type of demodulation applied to the signal accepted from the mixer.

14. (previously presented) An apparatus as in claim 13 wherein the type of demodulation

selected consists essentially of BPSK, QPSK, and QAM.

15. (original) An apparatus as in claim 10 wherein the combiner circuit comprises a XGMII.

16-25. (cancelled)

26. (currently amended) A method of processing data received from a ~~fiber~~ channel, the method comprising:

receiving a wideband signal;

mixing the wideband signal with a mixer frequency to produce a plurality of mixed signals;

filtering the plurality of mixed signals with a plurality of low-pass filters to produce a plurality of baseband signals;

demodulating the plurality of baseband signals with a plurality of programmable demodulators, thereby providing a plurality of demodulated digital outputs, wherein demodulating the plurality of baseband signals comprises providing soft decisions as an output;

providing a trellis decoding of the soft outputs and providing hard decisions; and

combining the hard decisions into at least one digital data stream.

27. (previously presented) The method of claim 26 wherein the mixer frequency is a programmable frequency.

28. (previously presented) The method of claim 26 wherein the plurality of low-pass filters have programmable bandwidth.

29. (previously presented) The method of claim 26 wherein the programmable demodulators comprise a control input that controls the type of demodulation applied to the baseband signals.

30. (previously presented) The method of claim 29 wherein the type of demodulation selected consists essentially of BPSK, QPSK and QAM.

31. (previously presented) The method of claim 26 wherein combining the hard decisions into at least one digital data stream comprises combining the hard decisions into at least one digital data

stream using a XGMII.

32. (cancelled)

33. (new) An apparatus for receiving data from a channel, the apparatus comprising:

an input that receives a wideband signal;

a plurality of mixers that accept the wideband signal and mix it with a mixer frequency;

a plurality of low-pass filters that filter the outputs of the mixers;

a plurality of programmable demodulators each, accepting the output of one of the low-pass filters and demodulating said low-pass filter output, thereby providing a demodulated digital output, the demodulators providing soft decisions as an output;

a combiner circuit for combining the soft decision outputs from the plurality of programmable demodulators into at least one soft decision data stream; and

at least one trellis decoder that accepts soft decisions from at least one demodulator and provides a trellis decoding of the soft outputs and provides a hard decision according to the at least one soft decision data stream.

34. (new) The apparatus as in claim 33, wherein the mixer frequency is a programmable frequency.

35. (new) The apparatus as in claim 33, wherein the plurality of mixers is two mixers.

36. (new) The apparatus as in claim 35, wherein the outputs of the mixers are in-phase and quadrature-phase to the mixer frequency.

37. (new) The apparatus as in claim 33, wherein the plurality of low-pass filters are Square Root Raised Cosine Filters.

38. (new) The apparatus as in claim 33, wherein the combiner circuit combines the soft decision outputs according to inter-symbol interference.

39. (new) The apparatus as in claim 33, wherein the combiner circuit combines the soft decision outputs according to attenuation and phase distortion introduced by the channel.

40. (new) The apparatus as in claim 33, wherein the programmable demodulators further comprise a control input that controls the type of demodulation applied to the signal accepted from the mixer.

41. (new) The apparatus as in claim 40, wherein the type of demodulation is based on the encoding applied in each symbol, and wherein an increase in the number of bits in a symbol decreases symbol error rate.

42. (new) A method of processing data received from a channel, the method comprising:

receiving a wideband signal;

mixing the wideband signal with a mixer frequency to produce a plurality of mixed signals;

filtering the plurality of mixed signals with a plurality of low-pass filters to produce a plurality of baseband signals;

demodulating the plurality of baseband signals with a plurality of programmable demodulators, thereby providing a plurality of demodulated digital outputs, wherein demodulating the plurality of baseband signals comprises providing soft decisions as an output;

providing a convolutional decoding of the soft outputs and providing hard decision data sections; and

demultiplexing the hard decision data sections into at least one digital data stream.

43. (new) The method as in claim 42, wherein the mixer frequency is a programmable frequency.

44. (new) The method as in claim 42, wherein the plurality of mixers is two mixers.

45. (new) The method as in claim 44, wherein the outputs of the mixers are in-phase and quadrature-phase to the mixer frequency.

46. (new) The method as in claim 42, wherein the plurality of low-pass filters are Square Root Raised Cosine Filters.

47. (new) The method as in claim 42, wherein the programmable demodulators provide the soft

decision outputs according to inter-symbol interference.

48. (new) The method as in claim 42, wherein the programmable demodulators provide the soft decision outputs according to attenuation and phase distortion introduced by the channel.

49. (new) The method as in claim 42, wherein the programmable demodulators further comprise a control input that controls the type of demodulation applied to the signal accepted from the mixer.

50. (new) The method as in claim 49, wherein the type of demodulation is based on the encoding applied in each symbol, and wherein an increase in the number of bits in a symbol decreases symbol error rate.

51. (new) An apparatus for receiving data from a channel, the apparatus comprising:

an input that receives a wideband signal;

a frequency shifting circuit that accepts the wideband signal and mixes the wideband signal with at least one frequency;

a plurality of low-pass filters that filter outputs of the frequency shifting circuit;

a plurality of demodulators, each accepting the output of a one of the low-pass filters and demodulating said outputs of the ones of the low-pass filter, thereby providing demodulated outputs, and wherein the demodulators provide soft decisions as an output;

a combiner circuit for combining the soft decision outputs from the plurality of programmable demodulators into at least one soft decision data stream; and

at least one trellis decoder that accepts soft decisions from the at least one demodulator and provides a trellis decoding of the soft outputs and provides a hard decision according to the at least one soft decision data stream.

52. (new) The apparatus of claim 51, wherein the frequency shifting circuit mixes the wideband signal with a plurality of frequencies, wherein the plurality of frequencies are at relatively constant intervals of a frequency spectrum.

53. (new) The apparatus of claim 52, wherein the relatively constant interval is approximately 200 MHz.

54. (new) The apparatus of claim 51 wherein the at least one frequency is programmable.

55. (new) The apparatus of claim 51 wherein the plurality of low-pass filters have programmable bandwidth.

56. (new) An apparatus as in claim 51 wherein the plurality of demodulators further comprise a control input that controls the type of demodulation applied to the signal accepted from the low pass filter.

57. (new) The apparatus of claim 51 wherein the demodulators demodulate according to a scheme selected from a group consisting essentially of BPSK, QPSK, and QAM.

58. (new) A method for receiving data from a channel, the method comprising:

receiving a wideband signal;

mixing the wideband signal with at least one frequency, thereby resulting in at least one mixed output;

filtering the at least one mixed output, thereby resulting in at least one filtered output;

demodulating the at least one filtered output, thereby providing at least one demodulated output and providing at least one soft decision;

combining the at least one soft decision into at least one soft decision data stream; and

trellis decoding the at least one soft decision and providing at least one hard decision according to the at least one soft decision data stream.

59. (new) The method of claim 58, wherein mixing the wideband signal with at least one

frequency further comprises:

mixing the wideband signal with a plurality of frequencies, wherein the plurality of frequencies are at relatively constant intervals of a frequency spectrum.

60. (new) The method of claim 59, wherein the relatively constant interval is approximately 200 MHz.

61. (new) The method of claim 58, wherein the at least one frequency is programmable.

62. (new) The apparatus of claim 51 wherein the demodulating comprises demodulation according to a scheme selected from a group consisting essentially of BPSK, QPSK, and QAM.

63. (new) An apparatus for receiving data from a channel, the apparatus comprising:

an input that receives a wideband signal;

an FFT circuit that accepts the wideband signal, mixes the wideband signal with at least one frequency, and filters the wideband signal mixed with the at least one frequency;

a plurality of demodulators, each accepting the output of a one of the low-pass filters and demodulating said outputs of the ones of the low-pass filter, thereby providing demodulated outputs, and wherein the demodulators provide soft decisions as an output;

a combiner circuit for combining the soft decision outputs from the plurality of programmable demodulators into at least one soft decision data stream; and

at least one trellis decoder that accepts soft decisions from the at least one demodulator and provides a trellis decoding of the soft outputs and provides a hard decision according to the at least one soft decision data stream.

64. (new) The apparatus of claim 63, wherein the FFT circuit comprises:

a frequency shifting circuit that accepts the wideband signal and mixes the wideband signal with the at least one frequency; and

a plurality of low-pass filters that filter outputs of the frequency shifting circuit;

65. (new) The apparatus of claim 64, wherein the plurality of low-pass filters have programmable bandwidth.

66. (new) The apparatus of claim 64, wherein the frequency shifting circuit mixes the wideband signal with a plurality of frequencies, wherein the plurality of frequencies are at relatively constant intervals of a frequency spectrum.

67. (new) The apparatus of claim 66, wherein the relatively constant interval is approximately 200 MHz.

68. (new) The apparatus of claim 63 wherein the at least one frequency is programmable.

69. (new) The apparatus of claim 63 wherein the plurality of demodulators further comprise a control input that controls the type of demodulation applied to the signal accepted from the low pass filter.

70. (new) The apparatus of claim 63 wherein the demodulators demodulate according to a scheme selected from a group consisting essentially of BPSK, QPSK, and QAM.